

IN THE CLAIMS

1. (Original) A method for forming an oxide layer in an integrated circuit device process, comprising:

growing a thermal oxide layer on a surface of a semiconductor substrate in a chemical vapor deposition (CVD) apparatus; and
forming a CVD material layer on the thermal oxide layer in the CVD apparatus.

2. (Original) The method of claim 1, wherein the thermal oxide layer is formed to a thickness of approximately 20Å to 100Å.

3. (Original) The method of claim 1, wherein the CVD material layer is formed of a material selected from the group consisting of silicon oxide, aluminum oxide, zirconium oxide, and tantalum oxide.

A3
4. (Original) The method of claim 1, further comprising: forming another material layer on the CVD material layer in the CVD apparatus.

5. (Original) The method of claim 1, wherein growing a thermal oxide layer comprises using O₂, N₂O or a combination thereof for an oxidizing ambient.

6. (Original) The method of claim 1, wherein growing a thermal oxide layer is carried out at a temperature of approximately 750°C to 1000°C.

7. (Original) The method of claim 1, wherein growing a thermal oxide layer is carried out at a temperature of approximately 750°C to 1000°C and forming a CVD material layer is carried out at a temperature of approximately 700°C to 850°C.

8. (Original) The method of claim 1, wherein the surface of the semiconductor substrate comprises a bottom and a sidewall of a trench formed by etching the substrate to a predetermined depth; and

wherein the thermal oxide layer is formed to a thickness of approximately 20Å to 100Å, and the CVD material layer is formed to a thickness of approximately 50Å to 400Å.

9. (Original) The method of claim 8, wherein the CVD material layer is formed of a material selected from the group consisting of silicon oxide, aluminum oxide, zirconium oxide, and tantalum oxide.

10. (Original) The method of claim 8, wherein growing a thermal oxide layer uses O₂, N₂O or a combination thereof as a source gas at a temperature of approximately 750°C to 1000°C, and forming a CVD material layer is carried out using N₂O and SiH₄ as source gases at a temperature of approximately 700°C to 850°C.

11. (Original) The method of claim 8, further comprising: forming a nitride liner layer on the CVD material layer in the CVD apparatus to a thickness of approximately 30Å to 100Å, and forming a trench filling layer on the nitride liner layer in the CVD apparatus to a thickness of approximately 3000Å to 10000Å.

12. (Original) A method of forming an oxide layer in an integrated circuit device process, comprising:

forming a thermal oxide layer on an exposed single crystalline silicon substrate in a chemical vapor deposition (CVD) apparatus; and

forming a CVD material layer on the thermal oxide layer in the CVD apparatus.

13. (Original) The method of claim 12, wherein forming a thermal oxide layer is carried out at a temperature of approximately 750°C to 1000°C, and forming a CVD material layer is carried out at a temperature of approximately 700°C to 850°C.

14. (Original) The method of claim 13, wherein O₂, N₂O or combination thereof is used as a source gas for forming a thermal oxide layer, and N₂O and SiH₄ are used as a source gas for forming a CVD material layer.

15. (Currently amended) A method of forming a layer for an integrated circuit device, comprising:

forming a trench in a single crystalline silicon substrate by etching;

forming a thermal oxide layer on a surface of the trench;

forming a conformal liner material layer on the thermal oxide layer; and

forming a nitride liner layer on the conformal liner material layer, wherein the thermal oxide layer, the liner material layer, and the nitride liner layer are formed in the same chemical vapor deposition (CVD) apparatus.

16. (Original) The method of claim 15, wherein the thermal oxide layer is formed to a thickness of 20Å to 100Å.

17. (Original) The method of claim 15, wherein the liner material layer is formed to a thickness of 50Å to 400Å.

18. (Original) The method of claim 15, wherein the liner material layer is made of a material selected from the group consisting of silicon dioxide, aluminum trioxide, zirconium oxide, and tantalum pentoxide.

19. (Cancelled) The method of claim 15, wherein the thermal oxide layer, the liner material layer, and the nitride liner layer are formed in the same chemical vapor deposition (CVD) apparatus.

20. (Currently amended) The method of claim ~~19~~ 15, wherein the thermal oxide layer is formed using O₂, N₂O or a combination thereof as a source gas at a temperature of approximately 750°C to 1000°C, and the liner material layer is a high temperature oxide layer formed using N₂O and SiH₄ as a source gas at a temperature of approximately 700°C to 850°C.

21. (Original) The method of claim 20, further comprising: forming a trench isolation material on the nitride liner layer in the same CVD apparatus to fill the trench.

22. (Currently amended) A method of forming an isolation trench, comprising, etching a single crystalline silicon substrate to form a trench therein; and

forming all layers, formed in the trench, in the trench in the same chemical vapor deposition (CVD) apparatus, wherein said all layers include a thermal oxide layer formed directly following formation of the trench, a liner material barrier layer formed on the thermal

23. (Cancelled)

24. (Currently amended) The method of claim ~~23~~ 22, wherein the thermal oxide layer is formed to a thickness of 20Å to 100Å, and the liner material barrier layer is formed to a thickness of 50Å to 400Å.

*deleted
Al*
25. (Currently amended) The method of claim ~~23~~ 22, wherein the thermal oxide layer is formed using O₂, N₂O or a combination thereof as a source gas at a temperature of approximately 750°C to 1000°C, and the liner material layer is a higher temperature oxide layer formed using N₂O and SiH₄ as a source gas at a temperature of approximately 700°C to 850°C.

26. (Currently amended) The method of claim ~~23~~ 22, wherein the liner material layer is made of a material selected from the group consisting of silicon oxide, aluminum oxide, zirconium oxide, and tantalum oxide.

27-28 (Withdrawn).

oxide layer, a nitride liner layer formed on the liner material barrier layer, and a trench isolation material layer formed on the nitride liner layer to fill the trench.

23. (Cancelled) The method of claim 22, wherein said all layers include a thermal oxide layer formed directly following formation of the trench, a liner material barrier layer formed on the thermal oxide layer, a nitride liner layer formed on the liner material barrier layer, and a trench isolation material layer formed on the nitride liner layer to fill the trench.

24. (Currently amended) The method of claim ~~23~~ 22, wherein the thermal oxide layer is formed to a thickness of 20Å to 100Å, and the liner material barrier layer is formed to a thickness of 50Å to 400Å.

25. (Currently amended) The method of claim ~~23~~ 22, wherein the thermal oxide layer is formed using O₂, N₂O or a combination thereof as a source gas at a temperature of approximately 750°C to 1000°C, and the liner material layer is a higher temperature oxide layer formed using N₂O and SiH₄ as a source gas at a temperature of approximately 700°C to 850°C.

26. (Currently amended) The method of claim ~~23~~ 22, wherein the liner material layer is made of a material selected from the group consisting of silicon oxide, aluminum oxide, zirconium oxide, and tantalum oxide.

27-28 (Withdrawn).